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EXAMINER	
LE, DUY K	
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6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/809,066	HINES ET AL.
	Examiner	Art Unit
	Duy K Le	2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27,29 and 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27,29 and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figure 2 shows phase shifters in the drawing even though in the specification, figure 2 is described as an embodiment with no phase shifters (page 8, lines 17-18). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

There is no claim 28. The claims go in sequence 27, 29, and 30.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-6, 18-22, 24, 25, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by anticipated by Hemmi et al. (U.S. Patent 6,275,184).

As to claim 1, Figures 3-5 in Hemmi disclose a multiple carrier wave system, comprising:

a collector (64, 94) including a focal point ("the first planar lens 64 is a Stripline Rotman lens, bi-focal pillbox lens, or other suitable two-dimensional lens. A Rotman lens is preferred because it has three focal points and thus better performance" (Col. 5, lines 22-26). "The second planar lens 94 is a Rotman lens 70 as previously described in connection with the first planar lens 64" (Col. 7, lines 20-22));

a first antenna array (60) sending a first carrier wave signal, said first antenna array including a first path and a second path wherein said first carrier wave signal is distributed into a first distributed signal sent by said first path of said first antenna array and a second distributed signal sent by said second path of said first antenna array such that said first and second distributed signals of said first carrier wave signal arrive at said focal point of said collector in modulo 2Π radian phase coherence with respect to each other; and a second antenna array (60) sending a second carrier wave signal, said second antenna array including a first path and a second path wherein said second carrier wave signal is distributed into a first distributed signal sent by said first path of said second antenna array and a second distributed signal sent by said second path of said second antenna array such that said first and second distributed signals of said second carrier wave signal arrive at said focal point of said collector in modulo 2Π radian phase coherence with respect to each other ("the first set of array elements 46 includes a plurality of discrete elements 60. Each element 60 includes an array of low noise amplifiers (LNA) 62), a first planar lens 64, and a first steering system 66. The low noise amplifiers 62 amplify the

component beam signals received by the radiating elements 42" (Col. 5, lines 15-20). "FIG. 4 illustrates a Stripline Rotman lens 70 for use as the first planar lens 64 in accordance with one embodiment of the present invention" (Col. 5, lines 31-33). "The Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction. Feed elements 74 at the bottom of the Rotman lens 70 collect the component beams that have been focused in the first direction" (Col. 5, lines 33-38). "The feed elements 74 are non-uniform in size and spacing in order to shape the beams 32 in the first direction to match the angular size and the angular spacing of the ground-based cells 20 in the first direction" (Col. 5, lines 40-43). "By varying the size and spacing of feed elements 74, the component beams may be shaped without phase shifting" (Col. 5, lines 57-59). As interpreted by examiner, the applicant specification described modulo 2Π radian phase coherence as zero phase delay of the signals. The component beams in Hemmi arrive at the Rotman lens and become focused in the first direction without phase shifting (zero phase delay)).

As to claims 2 and 21, the Hemmi reference discloses the system, further comprising: a first phase shifter controlling said phase of said first distributed signal of said first carrier wave signal; and a second phase shifter controlling said phase of said second distributed signal of said first carrier wave signal ("the intermediate beams from each element 60 of the first array of elements 46 are fed into separate elements 90 of the second set of array elements 48. Each element 90 of the second array includes a second planar lens 94 and a second steering system 96. The second planar lens 94 is a Rotman lens 70 as previously described in connection with the first planar lens 64. In this case, the Rotman lens 70 focuses and shapes the intermediate beams in the second direction" (Col. 7, lines 16-24). "The first set of array elements 46 steer the beams

32 in a first vertical direction and the second set of array elements 48 steer the beams 32 in a second horizontal direction" (Col. 5, lines 3-6)).

As to claims 3, 6, and 22, the Hemmi reference discloses the system of claims 2, 5, and 21, further comprising:

a first amplifier amplifying said first distributed signal of said first carrier wave signal; and a second amplifier amplifying said second distributed signal of said first carrier wave signal ("the first set of array elements 46 includes a plurality of discrete elements 60. Each element 60 includes an array of low noise amplifiers (LNA) 62), a first planar lens 64, and a first steering system 66. The low noise amplifiers 62 amplify the component beam signals received by the radiating elements 42" (Col. 5, lines 15-20)).

As to claims 4 and 5, the Hemmi reference discloses the system, wherein said first and second paths of said second antenna array are physically spaced with respect to the focal point of the collector so that said modulo 2Π radian phase coherence of said first and second distributed signals of said second carrier wave signal is achieved; and wherein said first and second paths of said first antenna array are physically spaced with respect to the focal point of the collector so that said modulo 2Π radian phase coherence of said first and second distributed signals of said first carrier wave signal is achieved ("FIG. 4 illustrates a Stripline Rotman lens 70 for use as the first planar lens 64 in accordance with one embodiment of the present invention" (Col. 5, lines 31-33). "The Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction. Feed elements 74 at the bottom of the Rotman lens 70 collect the component beams that have been focused in the first direction" (Col. 5, lines 33-38). "The feed elements 74 are non-uniform in size and spacing in order to shape the beams

32 in the first direction to match the angular size and the angular spacing of the ground-based cells 20 in the first direction" (Col. 5, lines 40-43). "By varying the size and spacing of feed elements 74, the component beams may be shaped without phase shifting" (Col. 5, lines 57-59). As interpreted by examiner, the applicant specification described modulo 2Π radian phase coherence as zero phase delay of the signals. The component beams in Hemmi arrive at the Rotman lens and become focused in the first direction without phase shifting (zero phase delay)).

As to claim 18, Figures 3-5 in Hemmi disclose a carrier wave system, comprising:

a reverse-fed Rotman lens (64, 94) including a set of array ports and a set of beam ports ("the first planar lens 64 is a Stripline Rotman lens, bi-focal pillbox lens, or other suitable two-dimensional lens. A Rotman lens is preferred because it has three focal points and thus better performance" (Col. 5, lines 22-26). "The second planar lens 94 is a Rotman lens 70 as previously described in connection with the first planar lens 64" (Col. 7, lines 20-22)); and

a first antenna array (60) sending a first carrier wave signal, said first antenna array including a first path and a second path wherein said first carrier wave signal is distributed into a first distributed signal sent by said first path of said first antenna array and a second distributed signal sent by said second path of said first antenna array, said first and second paths of said first antenna array being connected to first and second array ports of said set of array ports such that a combined energy of said first and second distributed signals of said first carrier wave signal is a maximum at a first beam port ("the first set of array elements 46 includes a plurality of discrete elements 60. Each element 60 includes an array of low noise amplifiers (LNA) 62), a first planar lens 64, and a first steering system 66. The low noise amplifiers 62 amplify the component beam signals received by the radiating elements 42" (Col. 5, lines 15-20). "FIG. 4 illustrates a Stripline

Rotman lens 70 for use as the first planar lens 64 in accordance with one embodiment of the present invention. Referring to FIG. 4, the Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction. Feed elements 74 at the bottom of the Rotman lens 70 collect the component beams that have been focused in the first direction" (Col. 5, lines 31-38). "The feed elements 74 are non-uniform in size and spacing in order to shape the beams 32 in the first direction to match the angular size and the angular spacing of the ground-based cells 20 in the first direction" (Col. 5, lines 40-43)).

As to claim 19, the Hemmi reference discloses the system of claim 18, further comprising:

a first connecting cable connecting said first path of said first antenna array to said first array port; and a second connecting cable connecting said second path of said first antenna array to said second array port ("FIG. 4 illustrates a Stripline Rotman lens 70 for use as the first planar lens 64 in accordance with one embodiment of the present invention. Referring to FIG.4, the Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction" (Col. 5, lines 31-36). As interpreted by examiner, the striplines are functionally equivalent to cable in providing connection).

As to claim 20, the Hemmi reference discloses the system of claim 19, wherein said first and second connecting cables are phase determined such that an electrical length of said first distributed signal from said first path of said first antenna array to said first array port is modulo 2Π equal to an electrical length of said second distributed signal from said second path of said first antenna array to said second array port ("FIG. 4 illustrates a Stripline Rotman lens 70 for use as the first planar lens 64 in accordance with one embodiment of the present invention.

Referring to FIG. 4, the Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction. Feed elements 74 at the bottom of the Rotman lens 70 collect the component beams that have been focused in the first direction" (Col. 5, lines 31-38). "By varying the size and spacing of feed elements 74, the component beams may be shaped without phase shifting" (Col. 5, lines 57-59). As interpreted by examiner, the applicant specification described modulo 2Π coherence as zero phase delay of the signals. The component beams in Hemmi arrive at the Rotman lens and become focused in the first direction without phase shifting (zero phase delay) so the striplines 72 are phase-determined).

As to claim 24, the Hemmi reference discloses the system of claim 18, further comprising:

a second antenna array sending a second carrier wave signal, said second antenna array including a first path and a second path wherein said second carrier wave signal is distributed into a first distributed signal sent by said first path of said second antenna array and a second distributed signal sent by said second path of said second antenna array, said first and second paths of said second antenna array being connected to third and fourth array ports of said set of array ports such that a combined energy of said first and second distributed signals of said second carrier wave signal is a maximum at a second beam port (see Col. 5, lines 15-64).

As to claim 25, the Hemmi reference discloses the system of claim 22, wherein said first and second beam ports are the same ("Referring to FIG. 4, the Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction. Feed elements 74 at the bottom of the Rotman lens 70 collect the component beams that have been focused in the first direction" (Col. 5, lines 33-38)).

As to claim 30, the Hemmi reference discloses the system of claim 18, wherein a phase shift setting associated with each of the first and second paths of the first antenna array is controlled to selectively maximize the combined energy at any one of two or more beam ports of the Rotman lens (see Col. 5, lines 3-64).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 7 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,275,184 to Hemmi et al. in view of Mulhauser et al. (U.S. Patent 6,181,293).

As to claim 7, the Hemmi reference discloses the system of claim 1. However, it does not disclose an E-M reflector reflecting said first and second carrier wave signals changing said focal point of said collector. The Mulhauser reference teaches an E-M reflector reflecting said first and second carrier wave signals changing said focal point of said collector ("referring to FIGS. 1-3 and 28, the antenna system includes reflector member 1" (Col. 5, lines 13-14). "The provision of reflector 1 in combination with dielectric lenses 3a and 3b allows the antenna system of certain embodiments of this invention to receive signals from satellites emitting either horizontally polarized signals or vertically polarized signals" (Col. 5, lines 31-35)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Hemmi to comprise an E-M reflector reflecting

said first and second carrier wave signals changing said focal point of said collector, as taught by Mulhauser, in order to receive horizontally polarized signals or vertically polarized signals.

As to claim 10, the Hemmi reference (Figures 3-5) discloses a multiple carrier wave system, comprising:

a collector (64, 94) including a focal point ("the first planar lens 64 is a Stripline Rotman lens, bi-focal pillbox lens, or other suitable two-dimensional lens. A Rotman lens is preferred because it has three focal points and thus better performance" (Col. 5, lines 22-26). "The second planar lens 94 is a Rotman lens 70 as previously described in connection with the first planar lens 64" (Col. 7, lines 20-22));

a first antenna array (60) sending a first carrier wave signal, said first antenna array including a first path and a second path wherein said first carrier wave signal is distributed into a first distributed signal sent by said first path of said first antenna array and a second distributed signal sent by said second path of said first antenna array such that said first and second distributed signals of said first carrier wave signal are polarized in a first orientation and arrive at said focal point of said collector in modulo 2Π radian phase coherence with respect to each other; and a second antenna array (60) sending a second carrier wave signal, said second antenna array including a first path and a second path wherein said second carrier wave signal is distributed into a first distributed signal sent by said first path of said second antenna array and a second distributed signal sent by said second path of said second antenna array such that said first and second distributed signals of said second carrier wave signal are polarized in a second orientation and arrive at said focal point of said collector in modulo 2Π radian phase coherence with respect to each other ("the first set of array elements 46 includes a plurality of discrete

elements 60. Each element 60 includes an array of low noise amplifiers (LNA) 62), a first planar lens 64, and a first steering system 66. The low noise amplifiers 62 amplify the component beam signals received by the radiating elements 42" (Col. 5, lines 15-20). "FIG. 4 illustrates a Stripline Rotman lens 70 for use as the first planar lens 64 in accordance with one embodiment of the present invention" (Col. 5, lines 31-33). "The first set of array elements 46 steer the beams 32 in a first vertical direction and the second set of array elements 48 steer the beams 32 in a second horizontal direction" (Col. 5, lines 3-6). "If the antenna system 40 is polarized to increase capacity, a corresponding set of stripline circuits 108 may be mounted to an opposite side of a cold board 106" (Col. 8, lines 11-13). "The Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction. Feed elements 74 at the bottom of the Rotman lens 70 collect the component beams that have been focused in the first direction" (Col. 5, lines 33-38). "The feed elements 74 are non-uniform in size and spacing in order to shape the beams 32 in the first direction to match the angular size and the angular spacing of the ground-based cells 20 in the first direction" (Col. 5, lines 40-43). "By varying the size and spacing of feed elements 74, the component beams may be shaped without phase shifting" (Col. 5, lines 57-59). As interpreted by examiner, the applicant specification described modulo 2Π radian phase coherence as zero phase delay of the signals. The component beams in Hemmi arrive at the Rotman lens and become focused in the first direction without phase shifting (zero phase delay)); and

However, it does not disclose an orthomode transducer (OMT) extracting from said collector said first and second carrier wave signals polarized in said first and second orientations, respectively. The Mulhauser reference teaches an orthomode transducer (OMT) extracting from

said collector said first and second carrier wave signals polarized in said first and second orientations, respectively ("unique orthogonal mode junction 4, having feed area 21, receives linear signals from reflector 1, and separates the horizontally polarized signals from the vertically polarized signals" (Col. 6, lines 9-12)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Hemmi to comprise an orthomode transducer (OMT) extracting from said collector said first and second carrier wave signals polarized in said first and second orientations, respectively, as taught by Mulhauser, in order to split up the multiple signals for processing and transmitting.

As to claim 11, Hemmi-Mulhauser discloses the system of claim 10, wherein said first and second orientations are orthogonal with respect to each other (Hemmi; ""The first set of array elements 46 steer the beams 32 in a first vertical direction and the second set of array elements 48 steer the beams 32 in a second horizontal direction" (Col. 5, lines 3-6). Mulhauser; "unique orthogonal mode junction 4, having feed area 21, receives linear signals from reflector 1, and separates the horizontally polarized signals from the vertically polarized signals" (Col. 6, lines 9-12)).

As to claim 12, Hemmi-Mulhauser discloses the system of claim 11, further comprising:

a first phase shifter controlling said phase of said first distributed signal of said first carrier wave signal; and a second phase shifter controlling said phase of said second distributed signal of said first carrier wave signal (Hemmi; "the intermediate beams from each element 60 of the first array of elements 46 are fed into separate elements 90 of the second set of array elements 48. Each element 90 of the second array includes a second planar lens 94 and a second

steering system 96. The second planar lens 94 is a Rotman lens 70 as previously described in connection with the first planar lens 64. In this case, the Rotman lens 70 focuses and shapes the intermediate beams in the second direction" (Col. 7, lines 16-24). "The first set of array elements 46 steer the beams 32 in a first vertical direction and the second set of array elements 48 steer the beams 32 in a second horizontal direction" (Col. 5, lines 3-6)).

As to claims 13 and 15, Hemmi-Mulhauser discloses the system of claims 12 and 14, further comprising:

a first amplifier amplifying said first distributed signal of said first carrier wave signal; and a second amplifier amplifying said second distributed signal of said first carrier wave signal (Hemmi; "the first set of array elements 46 includes a plurality of discrete elements 60. Each element 60 includes an array of low noise amplifiers (LNA) 62), a first planar lens 64, and a first steering system 66. The low noise amplifiers 62 amplify the component beam signals received by the radiating elements 42" (Col. 5, lines 15-20)).

As to claim 14, Hemmi-Mulhauser discloses the system of claim 11, wherein said first and second paths of said first antenna array are physically spaced with respect to the focal point of the collector so that said modulo 2n radian phase coherence of said first and second distributed signals of said first carrier wave signal is achieved (Hemmi; "FIG. 4 illustrates a Stripline Rotman lens 70 for use as the first planar lens 64 in accordance with one embodiment of the present invention" (Col. 5, lines 31-33). "The Stripline Rotman lens 70 includes a plurality of striplines 72 of varying lengths that focus the component beams in the first direction. Feed elements 74 at the bottom of the Rotman lens 70 collect the component beams that have been focused in the first direction" (Col. 5, lines 33-38). "The feed elements 74 are non-uniform in

size and spacing in order to shape the beams 32 in the first direction to match the angular size and the angular spacing of the ground-based cells 20 in the first direction" (Col. 5, lines 40-43). "By varying the size and spacing of feed elements 74, the component beams may be shaped without phase shifting" (Col. 5, lines 57-59). As interpreted by examiner, the applicant specification described modulo 2Π radian phase coherence as zero phase delay of the signals. The component beams in Hemmi arrive at the Rotman lens and become focused in the first direction without phase shifting (zero phase delay)).

7. Claims 8, 23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,275,184 to Hemmi et al. in view of Goldsmith et al. (U.S. Patent 5,619,061).

As to claims 8, 23, and 26, the Hemmi reference discloses the system of claims 1, 18, and 25. However, it does not disclose a band pass filter filtering said first and second carrier wave signals collected by said collector, and a band pass filter filtering said first carrier wave signals collected at said first beam port. The Goldsmith reference teaches a band pass filter filtering said first and second carrier wave signals collected by said collector (see Figures 41, 42 and Col. 17, line 50 to Col. 18, line 23).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Hemmi to comprise a band pass filter filtering said first and second carrier wave signals collected by said collector, and a band pass filter filtering said first carrier wave signals collected at said first beam port, as taught by Goldsmith, in order to selectively pass desired frequencies and minimize undesirable noise.

8. Claims 9 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,275,184 to Hemmi et al. in view of Gesbert et al. (U.S. Patent Application Publication 2002/0056066 A1).

As to claims 9 and 29, the Hemmi reference discloses the system of claims 1 and 18. However, it does not expressly disclose the first carrier wave signal sent by said first antenna array is at least one of TDMA, FDMA, and CDMA type. The Gesbert reference teaches the first carrier wave signal sent by said first antenna array is at least one of TDMA, FDMA, and CDMA type ("this should be done when employing a multi-carrier scheme, e.g., OFDMA, FDMA or CDMA in transmitting the data. Of course, the invention can also be used in TDMA" (page 2, col. 2, paragraph [0019], lines 3-6)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Hemmi wherein the first carrier wave signal sent by said first antenna array is at least one of TDMA, FDMA, and CDMA type, as taught by Gesbert, in order to transmit data at more than one frequency.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,275,184 to Hemmi et al. in view of Mulhauser et al. (U.S. Patent 6,181,293) and further in view of Goldsmith et al. (U.S. Patent 5,619,061).

As to claim 16, Hemmi-Mulhauser discloses the system of claim 10. However, it does not disclose a first band pass filter filtering said first carrier wave signal polarized in said first orientation and extracted by said OMT; and a second band pass filter filtering said second carrier wave signal polarized in said second orientation and extracted by said OMT. The Goldsmith reference teaches a first band pass filter filtering said first carrier wave signal polarized in said

first orientation and extracted by said OMT; and a second band pass filter filtering said second carrier wave signal polarized in said second orientation and extracted by said OMT (see Figures 41, 42 and Col. 17, line 50 to Col. 18, line 23).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Hemmi-Mulhauser to comprise a first band pass filter filtering said first carrier wave signal polarized in said first orientation and extracted by said OMT; and a second band pass filter filtering said second carrier wave signal polarized in said second orientation and extracted by said OMT, as taught by Goldsmith, in order to selectively pass desired frequencies and minimize undesirable noise.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,275,184 to Hemmi et al. in view of Mulhauser et al. (U.S. Patent 6,181,293) and further in view of Gesbert et al. (U.S. Patent Application Publication 2002/0056066 A1).

As to claim 17, Hemmi-Mulhauser discloses the system of claim 10. However, it does not disclose at least one of said first and second carrier wave signals sent by said first antenna array is at least one of TDMA, FDMA, and CDMA type. The Gesbert reference teaches at least one of said first and second carrier wave signals sent by said first antenna array is at least one of TDMA, FDMA, and CDMA type ("this should be done when employing a multi-carrier scheme, e.g., OFDMA, FDMA or CDMA in transmitting the data. Of course, the invention can also be used in TDMA" (page 2, col. 2, paragraph [0019], lines 3-6)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Hemmi-Mulhauser wherein at least one of said first and second carrier wave signals sent by said first antenna array is at least one of TDMA,

FDMA, and CDMA type, as taught by Gesbert, in order to transmit data at more than one frequency.

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,275,184 to Hemmi et al. in view of Goldsmith et al. (U.S. Patent 5,619,061).

As to claim 27, the Hemmi reference discloses the system of claim 24. However, it does not disclose a first band pass filter filtering said first carrier wave signal collected at said first beam port; and a second band pass filter filtering said second carrier wave signal collected at said first beam port. The Goldsmith reference teaches a first band pass filter filtering said first carrier wave signal collected at said first beam port; and a second band pass filter filtering said second carrier wave signal collected at said first beam port (see Figures 41, 42 and Col. 17, line 50 to Col. 18, line 23).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Hemmi to comprise a first band pass filter filtering said first carrier wave signal collected at said first beam port; and a second band pass filter filtering said second carrier wave signal collected at said first beam port, as taught by Goldsmith, in order to selectively pass desired frequencies and minimize undesirable noise.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Kim (U.S. Patent 6,337,659) discloses phased array base station antenna system having distributed low power amplifiers.

b. Archer et al. (U.S. Patent 4,845,507) discloses modular multibeam radio frequency array antenna system.

c. Muhlhauser et al. (U.S. Patent 5,495,258) discloses multiple beam antenna system for simultaneously receiving multiple satellite signals.

d. Stephens (U.S. Patent 6,452,546) discloses wavelength division multiplexing methods and apparatus for constructing photonic beamforming networks.

e. Petrelis et al. (U.S. Patent 5,204,686) discloses RF feed array.

f. Bossard (U.S. Patent 4,747,160) discloses low power multi-function cellular television system.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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